Remarks/Argument:

(1) STATUS OF CLAIMS

Claims 1, 3-9, 11-20, and 22-36 are pending in this application, and are reproduced above as finally rejected in the Office Action dated July 14, 2004. Those claims are as originally filed in an RCE. The status of the claims in the application preceding the RCE is summarized below.

During prosecution of the original application from which this RCE application derives, an amendment filed on November 25, 2003 changed claim 1 to recite that a micro-conversion comprises a shopper's conversion of one shopping step to another, and that a first visualization comprises at least three axes and at least one line intersecting less than all of the axes. That amendment further added claims 22-36, of which independent claim 22 recites that a line intersects axes representing shopping steps and terminates prior to intersecting all axes; and independent claim 30 recites a system that provides a graphical display comprising axes and a line that crosses less than all of the axes.

(2) STATUS OF AMENDMENTS

No amendment to the claims was proposed in this RCE application, either prior to or following the referenced Final Rejection.

(3) SUMMARY OF INTERVIEW

A telephonic interview was held between the undersigned representative, the Examiner, and the Examiner's supervisor on July 22, 2004, at the request of the undersigned in response to the final Office action dated July 14th, 2004. The undersigned created and provided the three drawing pages of Appendix B to the Examiner prior to that interview, which were discussed in the context of Figures 27, 29, and 32-33 of U.S. Patent No. 6,477,538 B2 to Yaginuma et al. (hereinafter, Yaginuma). Yaginuma was cited in the final Office Action as anticipating or teaching the graphical aspects of the pending claims. The undersigned represented that the six diagrams of Exhibit B represent the separate polygonal lines of Yaginuma Figures 32 and 33, the underlying data being tabulated at Yaginuma Figure 27 and the text indicating at col. 16, lines

35-54 that a difference in thickness of polygonal lines is due to highlighting. The undersigned argued that the drawings of Exhibit B show that no polygonal line intersects less than all axes of the display, directly contrary to the characterization of Figure 32 of Yaginuma at page 22 of the Office Action. No other Yaginuma teaching is seen to be relevant to a polygonal line that intersects less than all axes of a display.

The Examiner and his supervisor agreed that the drawings of Appendix B are fair representations of the relevant Yaginuma teachings, and that all polygonal lines of Yaginuma Figures 32-33 intersect all axes of the parallel coordinate display. However, they contended that the teachings of Yaginuma nevertheless would result in a polygonal line that does not intersect all such axes if the underlying data displayed were different from the examples of Yaginuma.

(4) SUMMARY OF INVENTION

The present invention is in the context of graphical representations of web data, such as a plurality of users' activity in shopping at an online store. Specifically, the present invention describes an interactive parallel coordinate system that can be used to explore clickstream data, which is a collection of web pages selected by a user in a single session. Clickstream data, and its graphical representation, may refer to one or multiple users and sessions. In a preferred embodiment, the axes of a parallel coordinate system are used to represent shopping steps. Exemplary shopping steps represented by axes include product view pages, shopping basket page, and purchase completion page, as shown in Appendix A (Figure 8 of the application). A clickstream of a shopping session is represented as a polygonal line that intersects the appropriate axes visited by the user in a particular session. Multiple similar sessions by different users may also be combined into a single polygonal line.

Where the final axis represents purchase completion, sessions ending without a purchase are represented by a polygonal line that terminates at an axis prior to that final axis. A line representing a session that does not intersect all axes of the display is herein termed for brevity as exhibiting a "drop-out". Appendix A is a copy of Figure 8 of the application, and drop-outs are evident for polygonal lines 808, 812 and 813 at the axis labeled "804 Basket Placement"; for

line 809 at the axis labeled "802 Product Impressions"; and for line 810 at the axis labeled " 803 Click-Throughs". Graphically representing these drop-outs is particularly valuable so that analysts and operators of on-line stores may readily see graphically at what point sessions (and users) leave their site, to isolate and identify lost potential sales. Further aspects include the display being dynamic, so that reviewers may filter, sample, cluster, color code, and query, with the results of those actions being dynamically displayed in a graphical representation. A categorizer axis is also disclosed to enable the graphical display to illustrate service providers or referring websites from which sessions are initiated. The categorizer axis 801 of Appendix A (Figure 8) shows two such referrers 806 and 807.

(5) ISSUES

For brevity, only the independent claims are argued herein. The references for each issue include U.S. Patent No. 6,286,030 B1 to Wenig et al. (hereinafter, Wenig) and U.S. Patent No. 6,477,538 B2 to Yaginuma et al. (hereinafter, Yaginuma), to which all independent claims stand rejected under 35 U.S.C. § 103(a) as obvious. U.S. Patent No. 6,223,215 B1 to Hunt et al. (hereinafter, Hunt) is an additional reference cited only against dependent claims.

A. The first issue presented for review relates to each of claims 1, 23 and 30, whether any combination of references teaches or suggests that a graphical representation comprises at least three axes and a line that intersects less than all of the axes.

B. The second issue presented for review relates to claim 1, whether any combination of references teaches or suggests at least one line that terminates at the axis wherein a shopping session ends.

C. The third issue presented for review relates to claim 1, whether any combination of references teaches or suggests deriving one or more micro-conversions from one or more shopping sessions, the micro-conversion comprising a shopper's conversion from one shopping step to another.

(6) ARGUMENT

Issue A: Does any combination of references teach or suggest a graphical representation comprising at least three axes and a line that intersects less than all of the axes?

Claim 1 recites in relevant part: "... one or more lines that each correspond to at least one said shopping session, at least one of the one or more lines intersecting less than all of the axes...". Claim 23 recites in relevant part "the line terminating prior to intersecting all of the axes", and claim 30 recites in relevant part "a line ... plotted against the axes but that crosses less than all of the axes."

As an overview, the abstract of Wenig recites that it is directed to a system and method that captures transmissions during a user session between a client and server. Requests from a client and responses by the server are captured and stored, which an analyzer may use to recreate the user session. The detailed description of Wenig teaches at col. 5, lines 25-30 that the user session is *recreated by generating the identical screens* that were viewed by the user (emphasis added). Alternative embodiments are seen to describe the various screens being generated offline or near real-time (col. 5, lines 33-39). Wenig's teaching related to visually recreating a user session appears limited to repeating the sequence of actual web pages visited (Wenig, col. 5, lines 14-18; 25-29), with the possible addition of environmental data such as traffic volume (col. 5, line 66 to col. 6, line 9).

While Wenig does include teachings respecting storing requests and responses between a client and a server (col. 1, lines 44-48), the Examiner concedes at page 4 of the Office Action that Wenig does not specifically disclose or teach graphically representing clickstream data as recited in claim 1. The stated advantages of an analyst determining how a client moves through an application and isolating errors as in col. 5, lines 1-18 are not seen to suggest any embodiments other than *recreating the screens or webpages exactly as visited during a user session.* Thus, Wenig is not seen to provide teachings that are particularly relevant to the claimed multi-axis display or to lines crossing those axes.

The abstract of Yaginuma describes an apparatus and method for displaying the results of a data mining process as multi-dimensional data, such as on a parallel coordinate axis. A user interface generates an axis of the display corresponding to the result of the data mining process, adds the axis to the parallel coordinate axis and displays the result of the data mining process on the added axis. Yaginuma provides numerous drawings that the undersigned broadly categorizes into three groups: automobile specifications (figures 6-7, 12, 45-47), groceries (figures 27, 29, 32-33), and industry classifications (figures 34, 35, 37, 40, 42). [The text related to Figures 48-51 does not appear to identify specific underlying data]. Each of these appears to be displays of non-sequential data points in a static database that are independent of one another. Yaginuma teaches displaying the *same* number of coordinate axes as fields detected (col. 6, lines 43-45); searching the entire record and obtaining values for *each* field (col. 6, lines 49-50); and connecting the data points with a line (col. 7, lines 1-2) (emphases added). These are explicit teachings away from a drop-out: the axes represent search criteria for all data returned from the search, so disaplyed data must satisfy each and every search criteria or it is never returned for display.

Respecting Yaginuma's display of automobile specifications, each axis of the parallel coordinate system represents search criteria (e.g., horsepower, weight, year, country), so that any polygonal line crossing the axes (and representing a particular automobile model) necessarily crosses all axes. This is because any model not intersecting an axis is not returned by the data mining engine; it fails one or more of the search criteria and is not returned for display. Respecting the groceries, the underlying data for Figures 29 and 32-33 is tabulated at Figure 27 (large table), as recited at Yaginuma col. 15, lines 37-64 and col. 16, lines 35-45 (wherein the text indicates that the flowcharts of the intervening figures operate to create the parallel coordinate displays from the underlying data). Exhibit B graphs each data entry separately, based on the tabulated data of Figure 27. No drop-outs are evident. Respecting the industry classification, no underlying data is enumerated, the associated text describes color-coding and selecting displayed lines, and no polygonal line is seen to intersect less than all axes of the display.

Every example of Yaginuma is seen to teach that the axes of the parallel coordinate display represent search criteria used in the data mining process, so that all data retrieved by the search are displayed as a line that necessarily intersects each parallel axis of the display. As recited in the above Summary of Interview, the position of the Patent Office is that a different set or type of underlying data, graphed according to the teachings of Yaginuma, would result in a drop-out. Applicant contends that changing the type of data underlying a Yaginuma display would not render a polygonal line that drops-out, and does not cure the shortfall in Yaginuma's explicit teachings related to Issue A.

Yaginuma's examples relating to automobile data appear to clearly represent that the parallel coordinate axes are search criteria, so only data satisfying each and every search criteria (e.g., that would cross every axis when plotted) is returned from a search of the underlying database. Yaginuma's examples relating to groceries imposes rule number, support, and degree of confidence axes in addition to the data points. As cited in the text at col. 15, lines 17-30, 'support value' and 'degree of confidence' show correlation between people who buy bread and butter and people who buy milk and jam. The 'rule number' corresponds to a combination between 'condition' (e.g., bread, butter) and 'result' (e.g., milk, jam). It is seen to be inherent in Yaginuma's teaching that only lines that intersect all axes of the display, including the additional 'rule number', 'support', and 'degree of confidence' axes that are not separately listed in the underlying data but added by Yaginuma in Figure 29, are plotted. This is true at least because any polygonal line that would drop-out would necessarily exhibit a support or degree of confidence of zero, and therefore would not be displayed because of the lack of correlation. For example, assume there is no correlation between people who buy bread and butter and people who buy milk and jam. Yaginuma would not display that data for the simple fact that there is no correlation and therefore no polygonal line to plot, just as there is no line in Yaginuma's Figure 29 showing a correlation between people who buy butter and milk and people who buy paper diapers and jam. Where the correlation (support or degree of confidence) of a searched condition/result pairing is zero, no polygonal line is plotted because there is no association between condition and result, and therefore no line that would connect them that could later drop out. Where the correlation of a searched condition/result pairing is greater than zero, any line

must necessarily intersect all axes of the display, because their correlation is non-zero by the very existence of the line.

Whereas Yaginuma's description of the data underlying the industry classification displays is less clear, these also appear limited only to displaying polygonal lines that intersect all parallel coordinate axes. Taking Figure 34 as an example, it appears that any country whose ratio of primary, secondary, or tertiary industry is zero would not be displayed. It is reasonable to assume that the database underlying the search that results in Yaginuma's Figure 34 includes more than the six displayed countries. The fact that Yaginuma mines data reveals that only some data is displayed, not the entire database. If, for example, Korea is within the underlying database but has a zero value for ratio of tertiary industry, Korea is not displayed because it is not returned from a database search. Just as with the automobile examples, the ratio of industry axes represent search criteria. The 'cluster 1' axis clusters different polygonal lines that are already graphed; those clustered lines must satisfy every search criteria and be returned from the database search before being clustered.

Hunt is not seen to include teachings relevant to displaying data, and the Examiner does not contend that it does. As above, the teaching of Wenig relevant to data display is seen to be limited to reproducing web pages as viewed by a user. Yaginuma is the sole reference recited against issue A. By the above argument, Applicant contends that Yaginuma's teachings are limited to displaying polygonal lines that intersect all axes. Neither reference is seen to teach or suggest that there might be valuable information in plotting data that is incomplete vis a vis the display axes, and therefore no reference suggests such a display. For at least the above reasons relating to Issue A, Applicant submits that each and every independent claim is non-obvious over any combination of the references.

Issue B: Does any combination of references teach or suggest at least one line that terminates at the axis wherein a shopping session ends?

Claim 1 recites in relevant part: "...one or more lines intersecting less than all of the axes and terminating at the axis wherein the at least one said shopping session ends." The first portion of this claim clause is discussed under Issue A. The entire clause is recited here to make clear that the line that terminates where the shopping session ends does not itself intersect all axes. That is to say, a reference that teaches a polygonal line that terminates at a final axis (such as a purchase shopping step axis), after also intersecting all other axes, does not anticipate this claim clause; the termination of the line must be where the shopping session ends for a line that does not cross all axes. An example is line 808 of Exhibit A (Figure 8); the shopping session ends for that user (or group of users) at basket placement axis 804, and the purchase axis 805 is not intersected.

The Office Action cites at page 4 and 6 to Yaginuma Abstract, col. 2, lines 13-43; col. 7, lines 1-11; col. 12, lines 25-27; and Figures 19, 21 and 23 as teaching this aspect (and others related to graphical representation). The abstract includes not text describing a line ending where a shopping session ends. Yaginuma col. 2, lines 13-43 constitute the Summary of the Invention, and do not specifically recite a polygonal line that terminates at the end of a shopping session but generically describes displaying the result of a data mining engine in a graph format. Yaginuma col. 7, lines 1-11 states, "Connecting the data points assigned for each record with a line.". There is no indication that the line terminates at the end of a shopping session. Assuming that the underlying data is a shopping session and that the line terminates at the end of the shopping session fails to consider the other portion of the relevant claim clause, that the line in question not intersect all axes. Finally, Yaginuma col. 12, lines 25-27 merely states that the line is drawn so as to reach the point on the axis representing the data mining result. This is seen to relate to the line's vertical crossing point across an axis, such as along the vertical length of axis D of the graph in Figure 19 to which this text relates.

The Office Action further cites to Yaginuma Figures 19, 21, and 23. Figure 19 adds an axis to the graph of Figure 18 (which is itself a reproduction of the automobile search of Figure 6). As Figures 6, 18 and 19 relate to automobile search criteria that are independent of one another (e.g., horsepower, weight, country), it is not seen how this might anticipate terminating a line where a shopping session ends. The shopping session includes sequential data points in that there must

be a precursor step prior to a final step, such as product view before basket placement or referrer prior to product view. Automobile search criteria are independent variables, in that they may be displayed in any order (e.g., horsepower-weight-country, or country-horsepower-weight). As such, there does not appear to be a corresponding 'end' to the automobile search criteria as there is an end to a shopping session.

Respecting Yaginuma Figures 21 and 23, these relate to adding additional axes to the display. No teaching in those figures or related text is seen to describe an 'end' of a session or other sequential serial data. Presuming the data of Wenig is graphed with the display of Yaginuma does not make obvious the substance of Issue B on two counts. First, the data of Wenig is a series of server requests and responses so that an analyst may view the identical web pages visited by a user. While this may be sequential data that has an 'end', it is not clear how one of ordinary skill would graph a series of web pages themselves on a parallel coordinate system. Second and more fundamental to Issue B, it is not seen that any Yaginuma display of the Wenig data, terminating at the end of a shopping session, would intersect less than all axes. Because Yaginuma's axes represent search criteria (as detailed in Issue A above), the end of a shopping session would necessarily be the final axis in the display, and the polygonal line would intersect all axes. Applying this reasoning to Exhibit A, a Yaginuma display of Wenig data represented by line 810 would show only three axes (801, 802, and 803), and all polygonal lines of Exhibit A would be displayed, save line 809 since line 809 would fail to satisfy each and every search criteria of the axes. The display would not illustrate that polygonal lines 808 or 811-814 extended beyond the axis 803, because axis 803 would be the rightmost or terminal axis of the display and axes 804-805 would not exist. Similarly, a Yaginuma display of Wenig data represented by line 812 would show only four axes (801, 802, 803 and 804), and all polygonal lines of Exhibit A would be displayed, save lines 809 and 810, since those lines would fail to satisfy each and every search criteria of the axes. The display would not illustrate that polygonal lines 811 or 814 extended beyond the axis 804, because axis 804 would be the rightmost or terminal axis of the display and axis 805 would not exist. In every instance, setting the termination of the polygonal line to the end of a user session terminates the display at that axis representing the end of the shopping session. Adding a further axis deletes any polygonal line

that would not intersect that additional axis, because the underlying data would fail a new data search that included the newly added axis. A new data search is necessary to properly plot against the new set of axes.

For at least the above reasons related to Issue B, the Applicant contends that claim 1 is novel and non-obvious over the combination of Wenig and Yaginuma.

Issue C: Does any combination of references teach or suggest deriving one or more micro-conversions from one or more shopping sessions, the micro-conversion comprising a shopper's conversion from one shopping step to another?

Claim 1 recites in relevant part: "deriving one or more micro-conversions from the one or more shopping sessions, the micro-conversion comprising a shopper's conversion from one shopping step to another;".

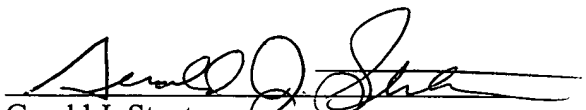
Wenig is not seen to teach or suggest deriving a micro-conversion from a shopping session. The Examiner cites at pages 4 and 5 of the Office Action to Wenig, col. 5, lines 3-13, and col. 4, lines 27-40 as disclosing this feature. While Wenig does note at col. 5, lines 8-11 that analysis may be of a user's navigation through a particular application that results in a purchase, it remains that the underlying data captured and stored by Wenig are the user requests and server responses, not a micro-conversion of them. Wenig, at col. 4, lines 27-40, recites that the series of captured and stored requests and responses are stored collectively as a user session. As recited above, Wenig teaches at col. 5, lines 25-39 that the user session is *recreated by generating the identical screens* that were viewed by the user (emphasis added). The present application also characterizes in the Background section at page 2, lines 10-11, that a user session is a series of web pages visited in a single visit. However, issue C is not confined only to a user or shopping session, but also includes a microconversion of that session. The data stored in Wenig that is available for graphical display according to Yaginuma remains the exact web pages visited by a user, not a microconversion from one shopping step to another even if those web pages visited constitute a

shopping session. Yaginuma is not asserted as including teachings relevant to issue B. The underlying data taught in Yaginuma and detailed above does not include virtual paths, online stores, shopping steps, microconversions, or any similar data. For at least the above reasons, Applicant asserts that claim 1 is novel and non-obvious over any combination of Wenig and Yaginuma.

While the above particularly characterizes the independent claims only, it is noted that the references do not appear fairly to teach or suggest the specific catagorizer axes recited in claim 13, the graphical comparison of first and alternate visualizations recited in claim 22, of the specific aspects of the virtual path recited in each of claims 27 and 35.

In light of the opposing positions adhered to by the Applicant and the Patent Office following the interview as summarized above, the Applicant has considered a different set of data underlying a Yaginuma display, and has again concluded that the claims remain non-obvious. The Applicant now respectfully requests that the Examiner reconsider the rejections in light of the above arguments. Applicant believes that no viable combination of the cited references anticipates or makes obvious any of the independent claims. Should the rejection be maintained, the Applicant respectfully requests an example of underlying data, whether or not within a reference, that may be displayed consistent with Yaginuma in a manner that reads on an independent claim. The undersigned remains available to discuss via teleconference any remaining matters or any lack of clarity in the above, at the Examiner's discretion.

Respectfully submitted:



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